

WHAT IS CLAIMED IS:

1. An ultrasonic bonding apparatus comprising:

a heater plate on which a lead frame having a plurality of leads is positioned in place, wherein a semiconductor chip with a plurality of electrodes is mounted on the lead frame and wherein the leads of the lead frame are supported on a supporting surface zone of the heater plate;

a holding member for pressing at least one of the leads of the lead frame against the supporting surface zone of the heater plate; and

a bonding tool for applying ultrasonic energy to a position where a wire is in contact with one of the electrodes of the semiconductor chip so that the wire is bonded to the electrode and for applying ultrasonic energy to a position where said wire is in contact with one of the leads so that the wire is bonded to the lead;

wherein a holding surface of the holding member for contact with the at least one of the leads of the lead frame has a surface roughness higher than that of the supporting surface zone of the heater plate.

2. The ultrasonic bonding apparatus in accordance with claim 1, wherein the surface roughness of the holding surface of the holding member is a ten-point mean surface

roughness Rz in the range of about 10-50 μm .

3. The ultrasonic bonding apparatus in accordance with claim 2, wherein the surface roughness of the supporting surface of the heater plate is a ten-point mean
5 surface roughness Rz in the range of about 0.5-1.5 μm .

4. The ultrasonic bonding apparatus in accordance with claim 1, further comprising a detector for detecting a
10 vibration of a first lead when a wire is bonded to a second lead, the first and second leads being two of the at least one of the leads of the lead frame, wherein the first lead and the corresponding electrode of the semiconductor have been connected with each other via a wire; and

15 wherein the bonding operation between the second lead and the wire is stopped when the detector detects an undesired vibration of the first lead.

5. The ultrasonic bonding apparatus in accordance with claim 1, further comprising a sensor for emitting
20 light toward the holding surface of the holding member and/or the supporting surface of the heater plate to detect a reflected light intensity.

25 6. An ultrasonic bonding method comprising the steps

of:

positioning a lead frame having a plurality of leads in place on a heater plate, wherein a semiconductor chip with a plurality of electrodes is mounted on the lead frame and wherein the leads of the lead frame are supported
5 on a supporting surface zone of the heater plate;

pressing at least one of the leads of the lead frame against the supporting surface zone of the heater plate by a holding member;

10 applying ultrasonic energy to a position where a wire is in contact with one of the electrodes of the semiconductor chip so that the wire is bonded to the electrode; and

applying ultrasonic energy to a position where
15 said wire is in contact with one of the leads so that the wire is bonded to the lead;

wherein a holding surface of the holding member for contact with the at least one of the leads has a surface roughness higher than that of the supporting
20 surface zone of the heater plate.